

What is claimed is:

1. A lead frame comprising:

a tie bar to which an element loading portion to be loaded with a semiconductor element is connected by a lead forming portion;

an outside frame formed with positioning holes, said tie bar being connected to said outside frame; and

a deformable portion included in said tie bar for preventing said outside frame from deforming.

2. The lead frame as claimed in claim 1, wherein said deformable portion is configured to deform during lead forming, which bends said lead forming portion, to thereby absorb stress acting on said tie bar.

3. The lead frame as claimed in claim 2, wherein said deformable portion is configured to absorb a force pulling said tie bar toward said element loading portion.

4. The lead frame as claimed in claim 3, wherein the semiconductor device comprises a photocoupler.

5. A frame comprising a combination of lead frames arranged such that element loading portions to be loaded with semiconductor elements thereof are positioned one above the other, said lead frames each comprising:

a tie bar to which the element loading portions are connected by lead forming portions;

an outside frame formed with positioning holes, said tie bar being connected to said outside frame; and

a deformable portion included in said tie bar for preventing said outside frame from deforming.

6. The frame as claimed in claim 5, wherein the element loading portions of only one of the lead frames are bent relative to lead forming portions associated therewith.

7. The frame as claimed in claim 6, wherein said deformable portion is sealed with resin to thereby form a reinforcing portion that prevents said deformable portion from deforming after lead forming.

8. The frame as claimed in claim 6, wherein the lead forming portions are bent while being crushed to be locally thinned and extended.

9. The frame as claimed in claim 8, wherein said reinforcing portion includes said deformable portion and a portion of said outside frame to which said deformable portion is connected.

10. The frame as claimed in claim 9, wherein said deformable portion prevents the positioning holes and the element loading portions from being displaced to thereby maintain a preselected positional relation between said positioning holes and said element loading portions.

11. In a semiconductor device comprising a pair of element loading portions loaded with semiconductor elements and positioned one above the other and seal resin sealing said pair of element loading portions, leads connected to a respective semiconductor element being exposed on said seal resin, only one of said pair of element loading

portions is bent upward relative to said leads.

12. The semiconductor device as claimed in claim 11, wherein the leads are positioned on an extension of a bottom of said seal resin.

13. The semiconductor device as claimed in claim 12, wherein said semiconductor device comprises a photocoupler comprising a light emitting element and a light-sensitive element that face each other.

14. The semiconductor device as claimed in claim 13, wherein the leads are implemented by lead forming portions included in a frame used to form semiconductor devices, said frame comprising a combination of lead frames each comprising:

a tie bar to which the element loading portions are connected by lead forming portion;

an outside frame formed with positioning holes, said tie bar being connected to said outside frame; and

a deformable portion included in said tie bar for protecting said outside frame from deforming.

15. A method of producing a semiconductor device by using a frame, said method comprising:

a lead forming step of bending lead forming portions after primary sealing using light-transmitting resin; and

a sealing step of sealing deformable portions included in a lead frame after said lead forming step.

16. The method as claimed in claim 15, wherein said sealing step is executed at the same time as secondary sealing using

light-intercepting resin and executed after said lead forming step.

17. The method as claimed in claim 16, wherein said lead forming step comprises bending the lead forming portions while crushing said lead forming portions to thereby locally thin and extend said lead forming portions.

18. The method as claimed in claim 17, wherein said lead forming step forms a step corresponding to a thickness of a bottom of the resin used for the secondary sealing.

19. The method as claimed in claim 15, wherein said frame comprises a combination of lead frames each comprising:

a tie bar to which element loading portions are connected by lead forming portions:

an outside frame formed with positioning holes, said tie bar being connected to said outside frame; and

a deformable portion included in said tie bar for protecting said outside frame from deforming.